Amendments to the Specification:

On page 1, prior to the first paragraph which begins on line 4, please insert the following:

FIELD OF THE INVENTION

On page 1, prior to the second paragraph which begins on line 15, please insert the following:

BACKGROUND OF THE INVENTION

Please replace the paragraph which begins on page 2, line 1 and ends on line 13, with the following rewritten paragraph:

In the case of the Doppler principle, ultrasonic measuring signals of known frequency are coupled into the flowing medium. The ultrasonic measuring signals reflected in the medium are evaluated. On the basis of a frequency shift occurring between the ultrasonic measuring signal which was coupled into the medium and the reflected ultrasonic measuring signal, likewise the flow velocity of the medium, or the volume and/or mass flow rate, can be determined. The use of flow measuring devices working according to the doppler principle [[is]] are only possible, when ~~present in the medium~~ are air bubbles or impurities are present in the medium, on which the ultrasonic measuring signals are reflected. Thus, the use of ultrasonic flow measuring devices using the Doppler principle is rather limited, compared to ultrasonic flow measuring devices using the travel-time-difference principle.

Please replace the paragraph which begins on page 2, line 22 and ends on page 3, line 4, with the following rewritten paragraph:

In the case of the two types of ultrasonic flow measuring devices, the ultrasonic measuring signals are radiated at a predetermined angle into, and/or received from, the

pipe containing the flowing medium. In order to be able to radiate the ultrasonic measuring signals at determined angles into and out of the pipe, and into and out of the medium, as the case may be, the in- and out-coupling of the ultrasonic measuring signals into and out of the pipe occurs in the case of clamp-on flow measuring devices via interface pieces, or coupling wedges. In order to achieve an optimum impedance matching, it is, moreover, known to make the coupling wedges of a suitably refracting material, e.g. a synthetic material, or plastic. ~~Principal~~ The principal component of an ultrasonic transducer is usually at least one piezoelectric element, which produces the ultrasonic measuring signals and/or receives them.

On page 4, prior to the paragraph which begins on line 5, please insert the following:

SUMMARY OF THE INVENTION

On page 8, prior to the paragraph which begins on line 27, please insert the following:

BRIEF DESCRIPTION OF THE DRAWINGS

Please replace the paragraph which begins on page 8, line 27 and which ends on page 9, line 29, with the following rewritten paragraph:

The invention will now be explained in greater detail on the basis of the appended drawings, the figures of which show as follows:
Fig. 1 a clamp-on flow measuring device, in a two-traverse arrangement;
Fig. 2 a graphical representation of travel time of an ultrasonic measuring signal in the two-traverse arrangement shown in Fig. 1, for the case of empty pipe;
Fig. 3 a graphical representation of travel time of an ultrasonic measuring signal in the two-traverse arrangement shown in Fig. 1, for the case of filled pipe;
Fig. 4 a clamp-on flow measuring device, in a one-traverse arrangement;
Fig. 5 a graphical representation of travel time of an ultrasonic measuring signal in the

one-traverse arrangement shown in Fig. 4, for the case of empty pipe;
Fig. 6 a graphical representation of travel time of an ultrasonic measuring signal in the one-traverse arrangement shown in Fig. 4, for the case of filled pipe;
Fig. 7 a graphical representation of travel time of an ultrasonic measuring signal in the two-traverse arrangement shown in Fig. 1, for the case of correct coupling of the ultrasonic transducers to the pipe;

Fig. 8 a graphical representation of travel time of an ultrasonic measuring signal in the two-traverse arrangement shown in Fig. 1, for the case of defective coupling of the ultrasonic transducers to the pipe; and
Fig. 9 a plot of the ultrasonic measuring signals of Fig. 8, with greater amplification factor.

On page 10, prior to the paragraph which begins on line 1, please insert the following:

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Please replace the paragraph which begins on page 10, line 6 and ends on line 12, with the following rewritten paragraph:

Essential components of the clamp-on ultrasonic flow measuring device are the two ultrasonic transducers 3, 4 and the control/evaluation unit 9. The two ultrasonic transducers 3, 4 are secured on the wall 8 of the pipe 7 by means of a securement device not separately shown in Fig. 1. Appropriate securement devices are well known from the state of the art and are also available from ~~the assignee~~ Endress + Hauser. The medium 10 flows through pipe 7 of predetermined inner diameter d_i in the stream direction S.

Please replace the paragraph which begins on page 10, line 24 and which ends on page 11, line 2, with the following rewritten paragraph:

The two ultrasonic transducers 3, 4 are positioned on the wall 8 of the pipe 7 in such a way that a high fraction of the emitted ultrasonic measuring signals is received in the respective other ultrasonic transducer [[4, 3]] 3, 4. The positioning of the transducers, one with respect to the other, is a function of different system and/or process variables, such as the inner diameter di of the pipe 7, the thickness w of the pipe wall 8, the velocity of sound cP in the material of which the pipe 7 is made, or the velocity of sound cM in the medium 10.

Please replace the paragraph which begins on page 11, line 22 and ends on line 30, with the following rewritten paragraph:

In the case of an empty pipe 7, the ultrasonic measuring signal has, as can be seen from Fig. 1, only the possibility of propagating via the pipe wall 8. An ultrasonic measuring signal emitted at time "zero" from the first ultrasonic transducer 3 is received following a time t1 by the second ultrasonic transducer 4. The travel time of the ultrasonic measuring signal can either be measured or calculated. A calculation of the travel time is possible at least to an approximation, when the geometric data (d_i and w) of the pipe and the acoustic properties of the pipe and medium (c_P and c_M) are known. Snell's Law is used for the calculation.

Please replace the paragraph which begins on page 12, line 9 and ends on line 21, with the following rewritten paragraph:

If medium is flowing through the pipe 7, then the largest part of the ultrasonic measuring signal emitted by one of the two ultrasonic transducers 3, 4 is coupled into the medium 10 and reaches the other ultrasonic transducer [[4, 3]] over the sound path SP1, which crosses the pipe 7, and, consequently, the flowing medium, two times. Due to the longer travel distance on the sound path SP1, an ultrasonic measuring signal is, as can be seen in Fig. 3, only received in the other ultrasonic transducer [[4, 3]] after the longer period of time t_2. To be added into these considerations is that, in many ~~cases of~~

~~application~~ applications, the sound velocity is lower in the medium 10 ~~that~~ than it is in the material of the pipe wall 8. Also this contributes to a delayed arrival of the measuring signal containing information concerning the volume, or mass, flow rate of the medium 10 in the pipe 7.

Please replace the paragraph which begins on page 12, line 23 and which ends on page 13, line 2, with the following rewritten paragraph:

Fig. 4 shows schematically a clamp-on flow measuring device in a one-traverse arrangement 1. The measuring device determines the volume, and/or mass, flow rate of the medium 10 in the pipe 7 likewise according to the known travel-time-difference method. In this case, the two ultrasonic transducers 3, 4 are placed on opposite sides of the pipe 7, displaced with resect to one another. In turn, the ultrasonic transducers are positioned such that as large a fraction as possible of an ultrasonic measuring signal emitted from a first ultrasonic transducer 3, 4 is received in the other ultrasonic transducer [[4, 3]] 3, 4.

Please replace the paragraph which begins on page 13, line 4 and ends on line 13, with the following rewritten paragraph:

Figs. 5 and 6 show in two diagrams, ~~as a function of time,~~ the amplitudes of the ultrasonic measuring signals propagating in the pipe wall 8 as a function of time, and, when present, in the medium 10. Reference is now made to the one-traverse arrangement 1 of the ultrasonic transducers 3, 4 shown in Fig. 4. While Fig. 5 shows the case of "malfunction", where pipe 7 is empty, Fig. 6 presents the "normal" case, in which medium 10 is flowing through the pipe 7. Also in this arrangement of the ultrasonic transducers 3, 4, at least the information concerning the case of "malfunction", preferably, however, also concerning the "normal" case, must be stored in some form in the control/evaluation unit 9 as the set value.

Please replace the paragraph which begins on page 13, line 15 and ends on line 22, with the following rewritten paragraph:

In the case of empty pipe 7, an ultrasonic measuring signal can only propagate via the pipe wall 8. Consequently, an ultrasonic measuring signal emitted from the first ultrasonic transducer 3, 4 shows itself in the second ultrasonic transducer [[4, 4]] as a noisy signal, as can be seen in Fig. 5. The time t_3, which passes before the emitted ultrasonic measuring signal is received, is, in turn, determined by the separation of the ultrasonic sensors 3, 4 and by the velocity of sound in the material of the pipe 7.

Please replace the paragraph which begins on page 13, line 24 and ends on page 14, line 2, with the following rewritten paragraph:

In the case of a filled pipe 7, an emitted measuring signal is received in the other ultrasonic transducer [[4, 3]] following a length of time t4. Also here, a comparison e.g. of the actual measuring signals with the set measuring signals permits an unequivocal decision as to whether the pipe 7 is filled with medium 10 or empty. As already mentioned, preferably a correlation is performed for the purpose of comparison. If the correlation coefficient between the set data and the actual data subceeds (falls below) or exceeds a predetermined value, then the report is issued indicating the specific malfunction.

Please replace the paragraph which begins on page 14, line 4 and ends on line 24, with the following rewritten paragraph:

Figs. 7 and 8 likewise show graphical presentations of the travel time of ultrasonic measuring signals for the two-traverse arrangement 2 illustrated in Fig. 1. The first peak corresponds to the fraction of the measuring signals, which propagate via the pipe 7, while the second peak represents the fraction of the ultrasonic measuring signals propagating via the medium 10. Fig. 7 shows ultrasonic measuring signals, as they

occur for the case of undisturbed, normal, measuring operation. Fig. 8 relates to the case where the coupling ~~medium~~ wedges 11, 12 [[is]] are largely removed from the pipe 7, so that there is only very little sound transmission between the ultrasonic transducers 3, 4 and the pipe 7. Thus, also in this case, the sound path is interrupted. One can see in Fig. 8 that the amplitudes of the two ultrasonic measuring signals become proportionately smaller compared to the normal measuring operation. This characterizing property can now be used even for distinguishing whether the damping of the measuring signals is a result of poor coupling of the ultrasonic transducers 3, 4 onto the pipe 7 or the result of strong damping by the pipe 7/medium 10 arrangement. In the extreme case, when the coupling is completely interrupted, no measuring signal can any longer be seen. Neither the measuring signal propagating via pipe 7 (first peak in Fig. 7) nor the measuring signal propagating via the medium 10 (second peak in Fig. 7) can be measured.

Page 16, delete the page in its entirety, lines 1-16.